SIEMENS

SIWAREX® U
Project planning in SIMATIC PCS7

User manual

Status 09/2008

Safety

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CAUTION
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SIWAREX U

Project planning in SIMATIC PCS7

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1 Preface

1.1 Purpose of the Information

This manual contains all the information required to configure a plant using SIWAREX U in PCS7.

1.2 Required Basic Knowledge

In order to understand the manual, certain knowledge concerning the SIMATIC automation technology especially PCS7 is required. Weighing technology knowledge is also an asset.

1.3 Scope of this Manual

This manual refers to the SIWAREX U module:

Type	**Name**	**Order number**	**from product status (Version)**	
SIWAREX U	SIWAREX U	7MH4950-1AA01 7MH4950-2AA01	HW 1.0	FW 1.1

Table 1-1 Validity of this manual

For these blocks PCS7 V7.0 from SP1 on is required.

1.4 Further Support

Do you have more questions concerning the use of SIWAREX U? Then please contact your Siemens representative in the office or business location that is responsible for your area or technical support for SIWAREX Tel.: +49 (0)721 595 2811.

Updated information on SIWAREX Weighing Technology as well as the newest versions of the SIWAREX user manuals can be found on the respective Internet Site.

http://www.siemens.com/weighing-technology

2 Scope of Delivery

The block is used to connect the SIWAREX U to the PCS7. The integration of SIWAREX U is possible for PCS7 Version V7.0 as of SP1.

In the first step, SIWAREX U must be added to the hardware catalogue by running the HSP.

While planning the hardware configuration in the SIMATIC Manager, the basic features of the module are defined:

- The peripheral address of the module
- Enabling the diagnostic alarms
- Enabling the process alarms
- Behaviour in the case of a CPU-Stop

SIWAREX U takes up 16 bytes in the input and output area.

Other scale specific parameters that are also changed while the control program is running can be defined in three different ways.

- Using the SIWATOOL U parameter definition tool
- Internally by making the definition in FB650 and then transferring to SIWAREX U
- In the OS using the Faceplate.

PCS7 blocks include the following components:

- CFC blocks for scale functionality (SIWA_U08), command controlling (CMD_SU08) and maintenance (MOD_SU08)
- Text libraries for use with message texts
- Example – faceplate: can be extended or modified using the Faceplate Designer.
- Example program

3 Overview

3.1 General

SIWAREX U (Compact Scale) is a versatile and flexible weighing module, which can be used wherever static scales are to be used in the SIMATIC S7 automation system or a force measurement is necessary.

PCS7 blocks enable SIWAREX U to be integrated into PCS7. The faceplates provided enable operation and monitoring of the scales and can be customized to the client.

3.2 Benefits

SIWAREX Getting Started has many advantages:

- Easy integration of scales in PCS7
- Straightforward transmission of commands in automatic mode
- Integration with PCS7 Maintenance Station
- Completed faceplates available for project-specific enhancements

3.3 Application Range

SIWAREX U is the optimal solution wherever the aim is to detect signals from strain gauge sensors or load cells. As weighing electronics, SIWAREX U offers good accuracy with a measuring time of 20 ms.

SIWAREX U is optimally equipped for the following applications:

- The fill-level monitoring of silos and bunkers
- The measurement of crane and rope loads, other strength measurements
- Load measurement for industrial elevators or rolling mills
- Weighing in areas with a risk of explosion (with SIWAREX IS Ex interface)
- Belt tensioning measurement

3.4 Structure

The project is made up of two parts:

- SIWAREX U PCS7 AS blocks
- SIWAREX U PCS7 OS blocks

The ALARM_8P messaging system is also used. In this way, the messages from SIWAREX U are displayed to the operator. The message texts are stored in the text library provided.

3.5 Function

The primary task of SIWAREX U consists in the measurement of the current weight value. By means of the integration in SIMATIC, there is the option of processing the weight value directly in the PLC.

SIWAREX-specific CFCs are available for configuration purposes. These are used to transfer commands and setting values to the scales. The scales can be operated, and the scale data displayed using the faceplates.

3.6 Commissioning and Service with SIWATOOL U

In principle, complete commissioning is possible via the CFC block.

Adjustment parameters (data record 3 and 4) can be modified retrospectively and scales readjusted via the faceplates.

The limits of both channels (data record 21 and 22) can be entered via the faceplate.

It is also possible to quickly and easily commission the module using the SIWATOOL PC program.

SIWATOOL U is included in the scope of delivery of the SIWAREX U configuration package for PCS7 (order number 7MH4950-3AK61). The program must be installed on a PC before commissioning can be performed. The PC is connected to the SIWAREX U using the cable available as an accessory.

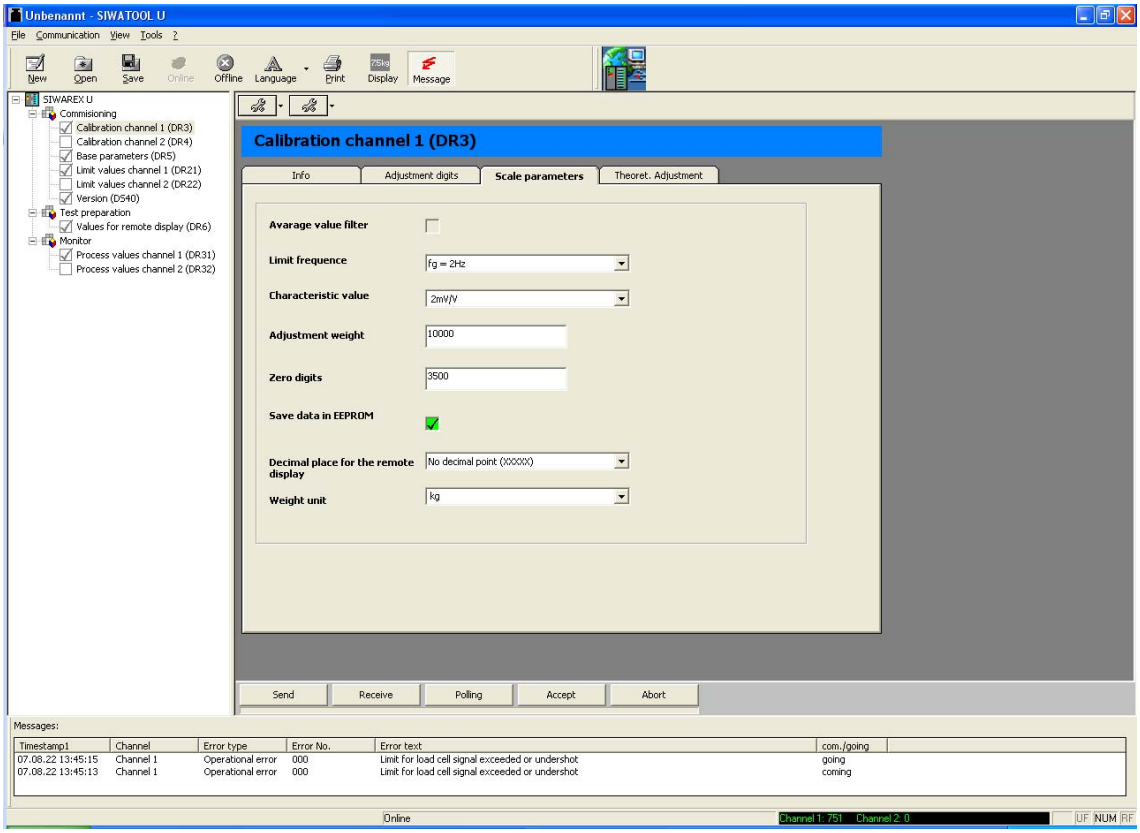


Fig. 3-1 Initial commissioning with SIWATOOL U

Note:

All data should be read by PCS7 after the parameters for SIWAREX U have been defined using SIWATOOL. Data in SIWAREX U will then be synchronized with data in the PCS7 project.

4 Description of the CFCs

4.1 CFC SIWA_U08 (FB650)

4.1.1 Calling OBs

The block SIWA_U08 must be installed in the run sequence of following OBs(automatically in CFC):

OB82	Diagnostic alarm
OB100	Restart (warm start)

4.1.2 Startup characteristics

Following initialization, the module ID of the attached module is read out to identify a parameter error. The messages remain blocked for the number of cycles configured at the RUNUPCYC input.

4.1.3 Function

The block is used to control a Siwarex U module. Data is transmitted cyclically via the peripheral interface and the various data records are read from the module and/or transferred to the module acyclically. The module message queue is continually read out and corresponding WinCC messages are issued.

4.1.4 User Text Library

Various messages in WinCC include an error text from user text libraries in addition to the error number. The user text libraries must be copied from the SIWA_U08 block library to the respective project by the user. To do this, open the SIWA_U08 library in SimaticManager, select the "Text Libraries" folder and copy this into your project. If a folder for user text libraries already exists in your project, please copy the SIWA_U08_DAT_OP, user text library into this folder.

4.1.5 Addressing Driver wizzard

The IO addresses for the Siwarex U module must be entirely within the CPU process-image. The LADDR input is interconnected with the base address of the Siwarex U module: Select input -> right mouse button -> Interconnection to

Address... -> input from e.g. IW512. The PCS7 driver wizard then automatically installs all required driver blocks. The MODF, PERAF, RACKF , ODIAG, ENCO and EN_CO block parameters are interconnected by the driver wizard; the SUBN1_ID, SUBN2_ID, RACK_NO, SLOT_NO, BASADR, DADDR and CO_NO inputs are configured according to the data from HW config.

4.1.6 Manual/automatik

Switching between the two modes of operation is carried out either through OS operation via AUT_ON_OP (LIOP_SEL = 0) or via the interconnection of the AUT_L (LIOP_SEL = 1) input. The appropriate permissions AUTOP_EN and MANOP_EN are required if the OS system route is taken. The operating mode selected is displayed on the QMAN_AUT output (1: automatic, 0: manual).

Manual Mode: Commands are transmitted from the operator to the block via the MAN_CMD input. Every command code modification on this input is identified as a new command. Manual inputs (ending "_M") act as the source for data records transmitted to the module.

Automatic mode: The block obtains its commands, with positive edge, at the AUTCMDEN input, from the AUT_CMD connectable input. Automatic inputs (ending "_A"), if available, act as the source for data records transmitted to the module; if unavailable, manual inputs fulfil this role (ending "_M").

Instead of the error code and a positive edge, automatic commands can also be triggered with the help of a connection block (see chapter 4.2) by adjusting a bit.

If no automatic command is being processed, but a command is nevertheless present at the MAN_CMD manual input, then this is executed, but always with the manual inputs (ending "_M") as the source for data records written to the module.

If neither a manual nor an automatic command is executed, then the background command specified at the BACK_CMD input is executed cyclically.

A command chain (e.g. read all data records) is interrupted by a new error code, but only ever after the individual command currently being processed has been executed.

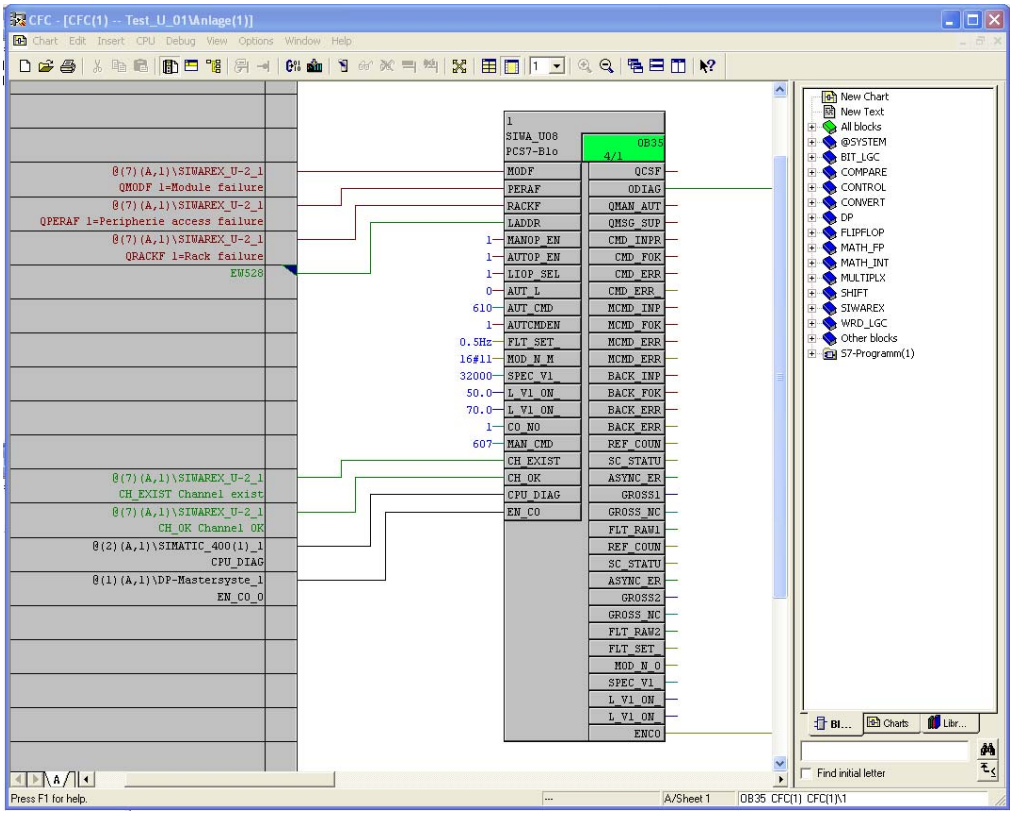


Fig. 4-1 Block SIWA_U08 in CFC

4.1.7 Data records

All data records that the S7 controller can access are available as individual parameters for the function block. Parameters for the data records that can be read take the ending "_O" for Output. Parameters of the data records that can be written end in "_M" for Manual and are transferred to WinCC for visualization. If applicable, manual inputs can also be connected in the AS program; however, they will no longer be operable in WinCC.

Values from SIWAREX are assumed for parameters ending "_M" and "_O" when data records from SIWAREX are read, in both automatic and manual modes.

The manual parameters (ending "_M") acts as the source datasets are written in SIWAREX. Dataset 3 or 4 is automatically read back after being transferred to the module.

All weight values from the dataset are also available as Real data input or output. Before every dataset is written, the scaled REAL value is converted into a fixed point value using the parameterized decimal places of the respective channel (output DEC_PLACE_x_O); this value is then transferred to the module. The unscaled input must not be changed by the user, as this will be overwritten during conversion. All unscaled input is labeled as "for internal use" in the module comments. Before you input the weight values the decimal places must be parameterized. Otherwise it is possible that the unscaled weight value is falsified because of a wrong number format.

After a dataset with scaled values has been read, its fixed point values are also converted and made available as REAL values. Unscaled outputs are labeled with "NC" ("not scaled") in the parameter names and can be further connected.

In SIWAREX U, some of the weighing specific data (e.g. number of decimal places) in datasets 3 and 4 is coded in bit groups. In CFC, the individual bits of these groups are merged into a byte and are made available as input or output on the module interface. Similarly to the scaling of weight values, these values are coded and decoded after the corresponding datasets are read or before the datasets are written. The numerical values of these inputs/outputs are transcoded into the relevant weighing-specific data.

4.1.8 Commands

Block command inputs in automatic mode are processed with the following priorities:

1. Automatic command (AUT_CMD, AUTCMDEN), automatic operating mode required
2. Manual command (MAN_CMD)
3. Command from adding a faceplate view (FP_CMD)
4. Background command (BACK_CMD)

If a new view is added in the faceplate, then the data records are read out whose values are presented here. The command code required for this is written to the FP_CMD parameter and copied to the MAN_CMD input (manual command) via the block and is thus executed as a manual command, assuming no other command is present here.

Code Channel 1	Code Channel 2	Command explanation
1	101	**Adjustment command adjustment zero valid** Adjustment zero command valid (activates calibration mode) The start of the characteristic curve - adjustment zero of the scale - is defined with the momentary dead-load.
2	102	**Adjustment command - adjustment weight 1 valid** The first adjustment point is determined by the momentary weight of the positioned adjustment weight.
3	103	**Set scale to zero** The current weight is set to zero.
5	105	**Predefine all data records with default values** All parameters are set to the status that was assigned originally by the manufacturer. The command always works on both channels.

The reading of a dataset is initiated using the command code "200 + dataset number"; the writing is initiated using "400 + dataset number". Furthermore, there are the following linked commands:

Code	Command explanation
601	Read all datarecords of channel 1: DR 3, 5, 6, 21, 31 und 40
602	Read all datarecords of channel 2: DR 4, 5, 6, 22, 32 und 40
604	Read DR 3 und 4

605	Read all datarecords: DR 3, 4, 5, 6, 21, 22, 31, 32 und 40
606	Write all datarecords of channel 1: DR 3, 5, 6 und 21
607	Write all datarecords of channel 2: DR 4, 5, 6 und 22
610	Write all datarecords: DR 3, 4, 5, 6, 21 und 22

4.1.9 Message text and message class assigned to the block parameters

Message-block ALARM_8P	**Message-No.**	**Block parameter**	**Default message text**	**Message-class**
EV_ID1	1	QPARF	Parametrierfehler	S
	2	CSF/QCSF	Externer Fehler (Leittechnik)	S
	3	QE_RAM	RAM Fehler Schreib-Leseprüfung	S
	4	QE_WDOG	Watchdogfehler	S
	5	QE_PALM	Prozessalarm verloren	S
	6	QE_EEPROM	EEPROM-Fehler	S
	7	QE_ADC	ADU-Fehler	S
	8	QE_EPROM	EPROM-Fehler	S
EV_ID2	1	QCH1_FLT	Kanal 1 gestört	S
	2	QCH2_FLT	Kanal 2 gestört	S
	3	QE_MINV1	Kanal1: Mindestspn. an Senseleitungen unterschritten	S
	4	QE_MINV2	Kanal2: Mindestspn. an Senseleitungen unterschritten	S
	5	QE_OFL1	Kanal1: Zahlenüberlauf bei Bruttogewicht	S
	6	QE_OFL2	Kanal2: Zahlenüberlauf bei Bruttogewicht	S
	7	QE_MEAS1	Kanal1: Messbereichsüberschreitung	S
	8	QE_MEAS2	Kanal2: Messbereichsüberschreitung	S
EV_ID3	1	QE_EXTV	Externe Hilfsspannung fehlt	S
	2	(interne Variable)	Daten/Bedienfehler Kanal1 (@8%d@): @8Y%t#SIWA_U08_DAT_OP@	S
	3	(interne Variable)	Daten/Bedienfehler Kanal2 (@9%d@): @9Y%t#SIWA_U08_DAT_OP@	S
	4	SIG3_4		
	5	SIG3_5		
	6	SIG3_6		
	7	SIG3_7		
	8	SIG3_8		

Table 4-1 CFC – Message texts of SIWA_U08

4.1.10 Assignment of associated values to the block parameters of SIWA_U08

Message-block ALARM_8P	Message-no.	Block parameter
EV_ID1	1	BA_NA
	2	STEP_NO
	3	BA_ID
	4	SUBN1_ID
	5	SUBN2_ID
	6	RACK_NO
	7	SLOT_NO
	8	si_NO_DAT_OP_CH1
	9	si_NO_DAT_OP_CH2
	10	AUX2PR10

Table 4-2 CFC – Associated values of SIWA_U08

4.1.11 Connections of SIWA_U08 (without data records)

Connection (Parameter)	Meaning	Data type	Default setting	Type	O&O
MODF	1=Module failure (is interconnected by module driver)	BOOL	FALSE	I	
PERAF	1=Peripherie access failure (is interconnected by module driver)	BOOL	FALSE	I	
RACKF	1=Rack failure (is interconnected by module driver)	BOOL	FALSE	I	
SUBN1_ID	ID of Primary Subnet (configured by the driver wizard)	BYTE	16#FF	I	
SUBN2_ID	ID of Redundant Subnet (configured by the driver wizard)	BYTE	16#FF	I	
RACK_NO	Rack Number (configured by the driver wizard)	BYTE	0	I	
SLOT_NO	Slot Number (configured by the driver wizard)	BYTE	0	I	
BASADR	Base Address of Siwarex-U Module (configured by the driver wizard)	INT	0	I	
DADDR	Diagnostic Address of Siwarex-U Module (configured by the driver wizard)	INT	0	I	
LADDR	Base Address of Siwarex-U Module This input must be **interconnected** to the base address: Right mouse button -> Interconnection to Address... -> e.g. IW128	WORD	0	I	
MANOP_EN	Enable: 1=Operator may input MANUAL	BOOL	TRUE	I	
AUTOP_EN	Enable: 1=Operator may input AUTO	BOOL	TRUE	I	
LIOP_SEL	Select: 1=Linking, 0=Operator active	BOOL	FALSE	I	

Connection (Parameter)	Meaning	Data type	Default setting	Type	O&O
AUT_L	Linkable Input for MANUAL/AUTO mode	BOOL	TRUE	I	
MSG_LOCK	Message Lock	BOOL	FALSE	I	x
RUNUPCYC	Lag: Number of Run Up Cycles	INT	10	I	
EV_ID1	Message ID1	DWORD	0	I	
EV_ID2	Message ID2	DWORD	0	I	
EV_ID3	Message ID3	DWORD	0	I	
BA_EN	Batch Enable	BOOL	FALSE	I	x
OCCUPIED	Occupied by Batch	BOOL	FALSE	I	x
BA_ID	Batch ID	DWORD	0	I	x
BA_NA	Batch Name	STRING[32]		I	x
STEP_NO	Batch Step Number	DWORD	0	I	x
BACK_CMD	Background Command	INT	0	I	x
AUT_CMD	Auto Command	INT	0	I	
AUTCMDEN	Execute command in Automatic Mode	BOOL	FALSE	I	
SIG3_x 4 <= x <= 8	free Message EV_ID3/Message x	BOOL	FALSE	I	
CO_NO	Coordination Number	INT		I	
AUX2PR10	Auxiliary Value 10/ EV_ID2	ANY		IO	
AUT_ON_OP	Operator Input Mode 1=AUTO, 0=MANUAL	BOOL	FALSE	IO	x
MAN_CMD	Manual Command	INT	0	IO	x
FP_CMD	Faceplate Command	INT	0	IO	x
CH_EXIST	Channel exist	DWORD	0	IO	
CH_OK	Channel OK	DWORD	0	IO	
EN_CO	Coordination Number	STRUCT		IO	
CPU_DIAG	CPU diagnosis (system structure)	STRUCT		IO	
QCSF	1=Control System Fault	BOOL	FALSE	O	x
QPARF	1=Parametration failure	BOOL	FALSE	O	
QMODF	1=Module failure	BOOL	FALSE	O	
QPERAF	1=Peripherie access failure	BOOL	FALSE	O	
QRACKF	1=Rack failure	BOOL	FALSE	O	
QCH1_FLT	Channel 1 fault	BOOL	FALSE	O	
QCH2_FLT	Channel 2 fault	BOOL	FALSE	O	
QCH2_NEX	1 = Channel 2 does not exist	BOOL	FALSE	O	x
ODIAG	Diagnostic Info	DWORD	0	O	
SFB_ERR_C	Error code of last SFB call	WORD	0	O	
L_DR_NO	Data record of the last started transfer	INT	0	O	
L_CMD	Last transferred Command	INT	0	O	
QMAN_AUT	1=AUTO, 0=MANUAL Mode	BOOL	FALSE	O	x
QMANOP	Status: 1=Operator enabled for MANUAL	BOOL	FALSE	O	x
QAUTOP	Status: 1=Operator enabled for AUTO	BOOL	FALSE	O	x
QCMDOP	1=Operator may start a command	BOOL	FALSE	O	x
M_CMD_EN	Enable: 1=Operator may input new MAN_CMD	BOOL	TRUE	O	x
QMSG_SUP	1=Message Suppression Active	BOOL	FALSE	O	x
QMSGERR1	1=Message ERROR 1	BOOL	FALSE	O	
QMSGERR2	1=Message ERROR 2	BOOL	FALSE	O	
QMSGERR3	1=Message ERROR 3	BOOL	FALSE	O	
MSG_STAT1	Message: STATUS Output 1	WORD	0	O	
MSG_STAT2	Message: STATUS Output 2	WORD	0	O	
MSG_STAT3	Message: STATUS Output 3	WORD	0	O	
MSG_ACK1	Message: ACK_STATE Output 1	WORD	0	O	
MSG_ACK2	Message: ACK_STATE Output 2	WORD	0	O	
MSG_ACK3	Message: ACK_STATE Output 3	WORD	0	O	
CMD_INPR	Automatic command in progress	BOOL	FALSE	O	
CMD_FOK	Automatic command finished ok	BOOL	FALSE	O	
CMD_ERR	Error by automatic command execution	BOOL	FALSE	O	

Connection (Parameter)	Meaning	Data type	Default setting	Type	O&O
CMD_ERR_C	Error code for automatic command execution	BYTE	16#00	O	
MCMD_INPR	Manual command in progress	BOOL	FALSE	O	
MCMD_FOK	Manual command finished ok	BOOL	FALSE	O	
MCMD_ERR	Error by manual command execution	BOOL	FALSE	O	
MCMD_ERR_C	Error code for manual command execution	BYTE	16#00	O	
BACK_INPR	Background command in progress	BOOL	FALSE	O	
BACK_FOK	Background command finished ok	BOOL	FALSE	O	
BACK_ERR	Error by background command execution	BOOL	FALSE	O	
BACK_ERR_C	Error code for background command execution	BYTE	0	O	
REF_COUNT1	Refresh counter channel 1	BYTE	16#00	O	
SC_STATUS1	Status of the scale channel 1	BYTE	16#00	O	x
ASYNC_ERR1	Asynchronous error channel 1	WORD	16#00	O	
GROSS1	Gross value channel 1	REAL	0.0	O	x
GROSS_NC_1	Gross value channel 1 (not scaled)	INT	0	O	
FLT_RAW1	Filtered raw value channel 1	WORD	16#00	O	
REF_COUNT2	Refresh counter channel 2	BYTE	16#00	O	
SC_STATUS2	Status of the scale channel 2	BYTE	16#00	O	x
ASYNC_ERR2	Asynchronous error channel 2	WORD	16#00	O	
GROSS2	Gross value channel 2	REAL	0.0	O	x
GROSS_NC_2	Gross value channel 2 (not scaled)	INT	0	O	
FLT_RAW2	Filtered raw value channel 2	WORD	16#00	O	
FB_ERR	Function block error occurred	BOOL	FALSE	O	
FB_ERR_C	Function block error code	BYTE	16#00	O	
START_UP	Start up of Siwarex in progress	BOOL	FALSE	O	
QE_RAM	1=RAM Error	BOOL	FALSE	O	
QE_WDOG	1=Watchdog Error	BOOL	FALSE	O	
QE_PALM	1=Process Alarm lost	BOOL	FALSE	O	
QE_EEPROM	1=EEPROM Error	BOOL	FALSE	O	
QE_ADC	1=Analog/Digital Converter Error	BOOL	FALSE	O	
QE_EPROM	1=EPROM Error	BOOL	FALSE	O	
QE_MINV1	1=Minimum voltage undershot at the sense lines channel1	BOOL	FALSE	O	
QE_MINV2	1=Minimum voltage undershot at the sense lines channel2	BOOL	FALSE	O	
QE_OFL1	1=Gross weight number overflow channel1	BOOL	FALSE	O	
QE_OFL2	1=Gross weight number overflow channel2	BOOL	FALSE	O	
QE_MEAS1	1=Measuring range exceeded channel1	BOOL	FALSE	O	
QE_MEAS2	1=Measuring range exceeded channel2	BOOL	FALSE	O	
QE_EXTV	1=External auxiliary voltage missing	BOOL	FALSE	O	
ENCO	Enable Coordination Number	BYTE		O	

Table 4-3 CFC-connections of SIWA_U08 (without data records)

4.1.12 Adjustment parameters (DR 3 and 4)

Adjustment parameters for channel 1 (Data record 3):

Inputs (derivated or scaled values):

Connection (Parameter)	Meaning	Data type	Default setting	Type	O&O
WGH_UNIT_1_M	DR3: Weight unit, Channel 1 0 = ' ' (no unit) 1 = 'g' 2 = 'kg' 3 = 't' 4 = 'oz' 5 = 'lb' 6 = 'lbs' 7 = 'kN'	BYTE		I	x
CHAR_V_1_M	DR3: Char. value of the load cell, Channel 1 0 = '<= 1mV/V' 1 = '<= 2mV/V' 2 = '<= 4mV/V'	BYTE		I	x
DEC_PLACE_1_M	DR3: Decimal place for remote display, Channel 1 0 = 'XXXXX' 1 = 'XXXX.X' 2 = 'XXX.XX' 3 = 'XX.XXX' 4 = 'X.XXXX'	BYTE		I	x
FLT_SET_1_M	DR3: Filter setting, Channel 1 0 = '---' 1 = '5Hz' 2 = '2Hz' 3 = '1Hz' 4 = '0.5Hz' 5 = '0.2Hz' 6 = '0.1Hz' 7 = '0.05Hz'	BYTE		I	x
AWGHT_1_M	DR3: Adjustment weight, Channel 1	REAL	10000.0	I	x

Table 4-6 CFC – connections of SIWA_U08 – DS3 inputs, derivated or scaled

Inputs (not scaled):

Connection (Parameter)	Meaning	Data type	Default setting	Type	O&O
Z_SET_1_M	DR3: Zero setting value, Channel 1	WORD		I	x
AVGF_1_M	DR3: Adj parameter average val. filter, bit 8, Channel 1	BOOL		I	x
SEEP_1_M	DR3: Adj parameter, save in EEPROM, bit 9, Channel 1	BOOL		I	x
CH_ACT_1_M	DR3: Adj parameter, channel activated, bit 10, Channel 1	BOOL		I	x
B11_1_M	DR3: Adj parameter settings, reserved, bit 11, Channel 1	BOOL		I	x
B12_1_M	DR3: for internal use, Adj parameter, weight unit, bit 0, Channel 1	BOOL		I	
B13_1_M	DR3: for internal use, Adj parameter, weight unit, bit 1, Channel 1	BOOL		I	

Connection (Parameter)	Meaning	Data type	Default setting	Type	O&O
B14_1_M	DR3: for internal use, Adj parameter, weight unit, bit 2, Channel 1	BOOL		I	
B15_1_M	DR3: Adj parameter, reserved, bit 15, Channel 1	BOOL		I	x
B0_1_M	DR3: for internal use, Adj parameter, char. value, bit 0, Channel 1	BOOL		I	
B1_1_M	DR3: for internal use, Adj parameter, char. value, bit 1, Channel 1	BOOL		I	
B2_1_M	DR3: for internal use, bit 0 of Char. value of the load cell, Channel 2	BOOL		I	
B3_1_M	DR3: for internal use, bit 1 of Char. value of the load cell, Channel 2	BOOL		I	
B4_1_M	DR3: for internal use, bit 2 of Char. value of the load cell, Channel 2	BOOL		I	
B5_1_M	DR3: for internal use, Adj parameter, limit freq., bit 0, Channel	BOOL		I	
B6_1_M	DR3: for internal use, Adj parameter, limit freq., bit 1, Channel 1	BOOL		I	
B7_1_M	DR3: for internal use, Adj parameter, limit freq., bit 2, Channel 1	BOOL		I	
DIG0_1_M	DR3: Adjustment digit 0, Channel 1	WORD		I	x
DIG1_1_M	DR3: Adjustment digit 1, Channel 1	WORD		I	x
INTERN_1_M	DR3: for internal use, Adjustment weight, Channel 1 (not scaled)	INT	10000	I	x

Table 4-6 CFC – connections of SIWA_U08 – DS3 inputs, not scaled

Outputs (derivated or scaled values):

Connection (Parameter)	Meaning	Data type	Default setting	Type	O&O
WGH_UNIT_1_O	DR3: Weight unit, Channel 1	STRING[3]		O	X
WGH_UNIT_B_1_O	DR3: Weight unit (Byte), Channel 1 0 = ' ' (keine Einheit) 1 = 'g' 2 = 'kg' 3 = 't' 4 = 'oz' 5 = 'lb' 6 = 'lbs' 7 = 'kN'	BYTE		O	
CHAR_V_1_O	DR3: Char. value of the load cell, Channel 1 0 = '<= 1mV/V' 1 = '<= 2mV/V' 2 = '<= 4mV/V'	BYTE		O	
DEC_PLACE_1_O	DR3: Decimal place for remote display, Channel 1 0 = 'XXXXX' 1 = 'XXXX.X' 2 = 'XXX.XX' 3 = 'XX.XXX' 4 = 'X.XXXX'	BYTE		O	
FLT_SET_1_O	DR3: Filter setting, Channel 1 0 = '---' 1 = '5Hz'	BYTE		O	

Connection (Parameter)	Meaning	Data type	Default setting	Type	O&O
	2 = '2Hz' 3 = '1Hz' 4 = '0.5Hz' 5 = '0.2Hz' 6 = '0.1Hz' 7 = '0.05Hz'				
AWGHT_1_O	DR3: Adjustment weight, Channel 1	REAL	10000.0	O	

Tabelle 4-4 CFC – connections of SIWA_U08 – DS3 outputs, derivated or scaled

Outputs (not scaled):

Connection (Parameter)	Meaning	Data type	Default setting	Type	O&O
Z_SET_1_O	DR3: Zero setting value, Channel 1	WORD		O	
AVGF_1_O	DR3: Adj parameter average val. filter, bit 8, Channel 1	BOOL		O	
SEEP_1_O	DR3: Adj parameter, save in EEPROM, bit 9, Channel 1	BOOL		O	
CH_ACT_1_O	DR3: Adj parameter, channel activated, bit 10, Channel 1	BOOL		O	
B11_1_O	DR3: Adj parameter settings, reserved, bit 11, Channel 1	BOOL		O	
B12_1_O	DR3: Adj parameter, weight unit, bit 0, Channel 1	BOOL		O	
B13_1_O	DR3: Adj parameter, weight unit, bit 1, Channel 1	BOOL		O	
B14_1_O	DR3: Adj parameter, weight unit, bit 2, Channel 1	BOOL		O	
B15_1_O	DR3: Adj parameter, reserved, bit 15, Channel 1	BOOL		O	
B0_1_O	DR3: Adj parameter, char. value, bit 0, Channel 1	BOOL		O	
B1_1_O	DR3: Adj parameter, char value, bit 1, Channel 1	BOOL		O	
B2_1_O	DR3: Adj parameter, decimal point, bit 0, Channel 1	BOOL		O	
B3_1_O	DR3: Adj parameter, decimal point, bit 1, Channel 1	BOOL		O	
B4_1_O	DR3: Adj parameter, decimal point, bit 2, Channel 1	BOOL		O	
B5_1_O	DR3: Adj parameter, limit freq., bit 0, Channel 1	BOOL		O	
B6_1_O	DR3: Adj parameter, limit freq., bit 1, Channel 1	BOOL		O	
B7_1_O	DR3: Adj parameter, limit freq., bit 2, Channel 1	BOOL		O	
DIG0_1_O	DR3: Adjustment digit 0, Channel 1	WORD		O	
DIG1_1_O	DR3: Adjustment digit 1, Channel 1	WORD		O	
AWGHT_NC_1_O	DR3: Adjustment weight, Channel 1 (not scaled)	INT	10000	O	

Table 4-5 CFC – connections of SIWA_U08– DS3 outputs, not scaled

Adjustment parameters for channel 2 (Data record 4):

Inputs (derivated or scaled values):

Connection (Parameter)	Meaning	Data type	Default setting	Type	O&O
WGH_UNIT_2_M	DR4: Weight unit, Channel 2 0 = ' ' (no unit) 1 = 'g' 2 = 'kg' 3 = 't' 4 = 'oz' 5 = 'lb' 6 = 'lbs' 7 = 'kN'	BYTE		I	X
CHAR_V_2_M	DR4: Char. value of the load cell, Channel 2 0 = '<= 1mV/V' 1 = '<= 2mV/V' 2 = '<= 4mV/V'	BYTE		I	X
DEC_PLACE_2_M	DR4: Decimal place for remote display, Channel 2 0 = 'XXXXX' 1 = 'XXXX.X' 2 = 'XXX.XX' 3 = 'XX.XXX' 4 = 'X.XXXX'	BYTE		I	X
FLT_SET_2_M	DR4: Filter setting, Channel 2 0 = '---' 1 = '5Hz' 2 = '2Hz' 3 = '1Hz' 4 = '0.5Hz' 5 = '0.2Hz' 6 = '0.1Hz' 7 = '0.05Hz'	BYTE		I	X
AWGHT_2_M	DR4: Adjustment weight, Channel 2	REAL	10000.0	I	X

Table 4-6 CFC – connections of SIWA_U08 – DS4 inputs, derivated or scaled

Inputs (not scaled):

Connection (Parameter)	Meaning	Data type	Default setting	Type	O&O
Z_SET_2_M	DR4: Zero setting value, Channel 2	WORD		I	X
AVGF_2_M	DR4: Adj parameter average val. filter, bit 8, Channel 2	BOOL		I	X
SEEP_2_M	DR4: Adj parameter, save in EEPROM, bit 9, Channel 2	BOOL		I	X
CH_ACT_2_M	DR4: Adj parameter, channel activated, bit 10, Channel 2	BOOL		I	X
B11_2_M	DR4: Adj parameter settings, reserved, bit 11, Channel 2	BOOL		I	X
B12_2_M	DR4: for internal use, Adj parameter, weight unit, bit 0, Channel 2	BOOL		I	
B13_2_M	DR4: for internal use, Adj parameter, weight unit, bit 1, Channel 2	BOOL		I	
B14_2_M	DR4: for internal use, Adj parameter, weight unit, bit 2, Channel 2	BOOL		I	
B15_2_M	DR4: Adj parameter, reserved, bit 15,	BOOL		I	X

Connection (Parameter)	Meaning	Data type	Default setting	Type	O&O
	Channel 2				
B0_2_M	DR4: for internal use, Adj parameter, char. value, bit 0, Channel 2	BOOL		I	
B1_2_M	DR4: for internal use, Adj parameter, char. value, bit 1, Channel 2	BOOL		I	
B2_2_M	DR4: for internal use, Adj parameter, decimal point, bit 0, Channel 2	BOOL		I	
B3_2_M	DR4: for internal use, Adj parameter, decimal point, bit 1, Channel 2	BOOL		I	
B4_2_M	DR4: for internal use, Adj parameter, decimal point, bit 2, Channel 2	BOOL		I	
B5_2_M	DR4: for internal use, Adj parameter, limit freq., bit 0, Channel 2	BOOL		I	
B6_2_M	DR4: for internal use, Adj parameter, limit freq., bit 1, Channel 2	BOOL		I	
B7_2_M	DR4: for internal use, Adj parameter, limit freq., bit 2, Channel 2	BOOL		I	
DIG0_2_M	DR4: Adjustment digit 0, Channel 2	WORD		I	X
DIG1_2_M	DR4: Adjustment digit 1, Channel 2	WORD		I	X
INTERN_2_M	DR4: for internal use, Adjustment weight, Channel 2 (not scaled)	INT	10000	I	X

Table 4-6 CFC – connections of SIWA_U08 – DS4 inputs, not scaled

Outputs (derivated or scaled values):

Connection (Parameter)	Meaning	Data type	Default setting	Type	O&O
WGH_UNIT_2_O	DR4: Weight unit, Channel 2	STRING[3]		O	X
WGH_UNIT_B_2_O	DR4: Weight unit (Byte), Channel 2 0 = ' ' (keine Einheit) 1 = 'g' 2 = 'kg' 3 = 't' 4 = 'oz' 5 = 'lb' 6 = 'lbs' 7 = 'kN'	BYTE		O	
CHAR_V_2_O	DR4: Char. value of the load cell, Channel 2 0 = '<= 1mV/V' 1 = '<= 2mV/V' 2 = '<= 4mV/V'	BYTE		O	
DEC_PLACE_2_O	DR4: Decimal place for remote display, Channel 2 0 = 'XXXXX' 1 = 'XXXX.X' 2 = 'XXX.XX' 3 = 'XX.XXX' 4 = 'X.XXXX'	BYTE		O	
FLT_SET_2_O	DR4: Filter setting, Channel 2 0 = '---' 1 = '5Hz' 2 = '2Hz' 3 = '1Hz' 4 = '0.5Hz' 5 = '0.2Hz' 6 = '0.1Hz'	BYTE		O	

Connection (Parameter)	Meaning	Data type	Default setting	Type	O&O
	7 = '0.05Hz'				
AWGHT_2_O	DR4: Adjustment weight, Channel 2	REAL	10000.0	O	

Table 4-6 CFC – connections of SIWA_U08 – DS4 outputs, derivated or scaled

Outputs (not scaled):

Connection (Parameter)	Meaning	Data type	Default setting	Type	O&O
Z_SET_2_O	DR4: Zero setting value, Channel 2	WORD		O	
AVGF_2_O	DR4: Adj parameter average val. filter, bit 8, Channel 2	BOOL		O	
SEEP_2_O	DR4: Adj parameter, save in EEPROM, bit 9, Channel 2	BOOL		O	
CH_ACT_2_O	DR4: Adj parameter, channel activated, bit 10, Channel 2	BOOL		O	
B11_2_O	DR4: Adj parameter settings, reserved, bit 11, Channel 2	BOOL		O	
B12_2_O	DR4: Adj parameter, weight unit, bit 0, Channel 2	BOOL		O	
B13_2_O	DR4: Adj parameter, weight unit, bit 1, Channel 2	BOOL		O	
B14_2_O	DR4: Adj parameter, weight unit, bit 2, Channel 2	BOOL		O	
B15_2_O	DR4: Adj parameter, reserved, bit 15, Channel 2	BOOL		O	
B0_2_O	DR4: Adj parameter, char. value, bit 0, Channel 2	BOOL		O	
B1_2_O	DR4: Adj parameter, char value, bit 1, Channel 2	BOOL		O	
B2_2_O	DR4: Adj parameter, decimal point, bit 0, Channel 2	BOOL		O	
B3_2_O	DR4: Adj parameter, decimal point, bit 1, Channel 2	BOOL		O	
B4_2_O	DR4: Adj parameter, decimal point, bit 2, Channel 2	BOOL		O	
B5_2_O	DR4: Adj parameter, limit freq., bit 0, Channel 2	BOOL		O	
B6_2_O	DR4: Adj parameter, limit freq., bit 1, Channel 2	BOOL		O	
B7_2_O	DR4: Adj parameter, limit freq., bit 2, Channel 2	BOOL		O	
DIG0_2_O	DR4: Adjustment digit 0, Channel 2	WORD		O	
DIG1_2_O	DR4: Adjustment digit 1, Channel 2	WORD		O	
AWGHT_NC_2_O	DR4: Adjustment weight, Channel 2 (not scaled)	INT	10000	O	

Table 4-7 CFC – connections of SIWA_SU08 – DS4 outputs, not scaled

4.1.13 Base parameters (Data record 5)

Inputs:

Connection (Parameter)	Meaning	Data type	Default setting	Type	O&O
MOD_N_M	DR5: Module number	BYTE		I	X
P_BIT_M	DR5: With or without parity bit	BOOL		I	X
P_TYPE_M	DR5: Even parity / Odd parity	BOOL		I	X
T_RDISP_M	DR5: Type of remote display	BYTE		I	X
A_LED_1_M	DR5: Allocation of LED 1	BYTE	B#16#65	I	X
A_LED_2_M	DR5: Allocation of LED 2	BYTE	B#16#66	I	X
Res15_M	DR5: Reserved	BYTE		I	X

Table 4-8 CFC – connections of SIWA_U08 – DS5 inputs

Outputs:

Connection (Parameter)	Meaning	Data type	Default setting	Type	O&O
MOD_N_O	DR5: Module number	BYTE			O
P_BIT_O	DR5: With or without parity bit	BOOL			O
P_TYPE_O	DR5: Even parity / Odd parity	BOOL			O
T_RDISP_O	DR5: Type of remote display	BYTE			O
A_LED_1_O	DR5: Allocation of LED 1	BYTE	B#16#65		O
A_LED_2_O	DR5: Allocation of LED 2	BYTE	B#16#66		O
Res15_O	DR5: Reserved	BYTE			O

Table 4-9 CFC – connections of SIWA_U08 – DS5 outputs

4.1.14 Output values for remote display (Data record 6)

Inputs:

Connection (Parameter)	Meaning	Data type	Default setting	Type	O&O
SPEC_V1_M	DR6: Specified value 1	INT		I	X
SPEC_V2_M	DR6: Specified value 2	INT		I	X

Table 4-10 CFC – connections of SIWA_U08 – DS6 inputs

Outputs:

Connection (Parameter)	Meaning	Data type	Default setting	Type	O&O
SPEC_V1_O	DR6: Specified value 1	INT		O	
SPEC_V2_O	DR6: Specified value 2	INT		O	

Table 4-11 CFC – connections of SIWA_U08 – DS6 outputs

4.1.15 Limit values (Data record 21 and 22)

Limit values channel 1 (Data record 21)

Inputs (scaled values):

Connection (Parameter)	Meaning	Data type	Default setting	Type	O&O
L_V1_ON_1_M	DR21: Limit value 1 ON, Channel 1	REAL	10000.0	I	X
L_V1_OFF_1_M	DR21: Limit value 1 OFF, Channel 1	REAL	9990.0	I	X
L_V2_ON_1_M	DR21: Limit value 2 ON, Channel 1	REAL	1000.0	I	X
L_V2_OFF_1_M	DR21: Limit value 2 OFF, Channel 1	REAL	1010.0	I	X

Table 4-12 CFC–connections of SIWA_U08 – DS21 inputs, scaled values

Inputs (not scaled):

Connection (Parameter)	Meaning	Data type	Default setting	Type	O&O
L_INT0_1_M	DR21: for internal use, Limit value 1 ON, Channel 1 (not scaled)	INT	10000	I	
L_INT1_1_M	DR21: for internal use, Limit value 1 OFF, Channel 1 (not scaled)	INT	9990	I	
L_INT2_1_M	DR21: for internal use, Limit value 2 ON, Channel 1 (not scaled)	INT	1000	I	
L_INT3_1_M	DR21: for internal use, Limit value 2 OFF, Channel 1 (not scaled)	INT	1010	I	

Table 4-13 CFC–connections of SIWA_U08 – DS21 inputs, not scaled

Outputs (scaled values):

Connection (Parameter)	Meaning	Data type	Default setting	Type	O&O
L_V1_ON_1_O	DR21: Limit value 1 ON, Channel 1	REAL	10000.0	O	
L_V1_OFF_1_O	DR21: Limit value 1 OFF, Channel 1	REAL	9990.0	O	
L_V2_ON_1_O	DR21: Limit value 2 ON, Channel 1	REAL	1000.0	O	
L_V2_OFF_1_O	DR21: Limit value 2 OFF, Channel 1	REAL	1010.0	O	

Table 4-14 CFC–connections of SIWA_U08 – DS21 outputs, scaled values

Outputs (not scaled):

Connection (Parameter)	Meaning	Data type	Default setting	Type	O&O
L_V1_ON_NC_1_O	DR21: Limit value 1 ON, Channel 1 (not scaled)	INT	10000	O	
L_V1_OFF_NC_1_O	DR21: Limit value 1 OFF, Channel 1 (not scaled)	INT	9990	O	
L_V2_ON_NC_1_O	DR21: Limit value 2 ON, Channel 1 (not scaled)	INT	1000	O	
L_V2_OFF_NC_1_O	DR21: Limit value 2 OFF, Channel 1 (not scaled)	INT	1010	O	

Table 4-15 CFC–connections of SIWA_U08 – DS21 outputs, not scaled

Limit values channel 2 (Data record 22)

Input (scaled values):

Connection (Parameter)	Meaning	Data type	Default setting	Type	O&O
L_V1_ON_2_M	DR22: Limit value 1 ON, Channel 2	REAL	10000.0	I	X
L_V1_OFF_2_M	DR22: Limit value 1 OFF, Channel 2	REAL	9990.0	I	X
L_V2_ON_2_M	DR22: Limit value 2 ON, Channel 2	REAL	1000.0	I	X
L_V2_OFF_2_M	DR22: Limit value 2 OFF, Channel 2	REAL	1010.0	I	X

Table 4-16 CFC–Aconnections of SIWA_U08 – DS22 inputs, scaled values

Inputs (not saled):

Connection (Parameter)	Meaning	Data type	Default setting	Type	O&O
L_INT0_2_M	DR22: for internal use, Limit value 1 ON, Channel 2 (not scaled)	INT	10000	I	
L_INT1_2_M	DR22: for internal use, Limit value 1 OFF, Channel 2 (not scaled)	INT	9990	I	
L_INT2_2_M	DR22: for internal use, Limit value 2 ON, Channel 2 (not scaled)	INT	1000	I	
L_INT3_2_M	DR22: for internal use, Limit value 2 OFF, Channel 2 (not scaled)	INT	1010	I	

Table 4-17 CFC–connections of SIWA_U08 – DS22 inputs, not scaled

Outputs (scaled values):

Connection (Parameter)	Meaning	Data type	Default setting	Type	O&O
L_V1_ON_2_O	DR22: Limit value 1 ON, Channel 2	REAL	10000.0	O	
L_V1_OFF_2_O	DR22: Limit value 1 OFF, Channel 2	REAL	9990.0	O	
L_V2_ON_2_O	DR22: Limit value 2 ON, Channel 2	REAL	1000.0	O	
L_V2_OFF_2_O	DR22: Limit value 2 OFF, Channel 2	REAL	1010.0	O	

Table 4-18 CFC–connections of SIWA_U08 – DS22 outputs, scaled values

Output (not scaled):

Connection (Parameter)	Meaning	Data type	Default setting	Type	O&O
L_V1_ON_NC_2_O	DR22: Limit value 1 ON, Channel 2 (not scaled)	INT	10000	O	
L_V1_OFF_NC_2_O	DR22: Limit value 1 OFF, Channel 2 (not scaled)	INT	9990	O	
L_V2_ON_NC_2_O	DR22: Limit value 2 ON, Channel 2 (not scaled)	INT	1000	O	
L_V2_OFF_NC_2_O	DR22: Limit value 2 OFF, Channel 2 (not scaled)	INT	1010	O	

Table 4-19 CFC–connections of SIWA_U08 – DS22 outputs, not scaled

4.1.16 Process values (Data records 31 and 32)

Process values chammel 1 (Data record 31)

Output (scaled value):

Connection (Parameter)	Meaning	Data type	Default setting	Type	O&O
GROSS_1_O	DR31: Gross value, Channel 1	REAL		O	X

Table 4-20 CFC–connections of SIWA_U08 – DS31 outputs, scaled value

Outputs (not scaled):

Connection (Parameter)	Meaning	Data type	Default setting	Type	O&O
GROSS_NC_1_O	DR31: Gross value, Channel 1 (not scaled)	INT		O	X
ASYNC_E_1_O	DR31: Asynchronous error (group error)	BOOL		O	X
SYNC_E_1_O	DR31: Synchronous error (group error)	BOOL		O	X
L_V1_1_O	DR31: Limit value 1, Channel 1	BOOL		O	X
L_V2_1_O	DR31: Limit value 2, Channel 1	BOOL		O	X
SC_A_1_O	DR31: Scale adjusted, Channel 1	BOOL		O	X
UPD_B_1_O	DR31: Bit is inverted each time the Siwarex U updates its measured value	BOOL		O	X
LIFE_B_1_O	DR31: Life bit used for I/O communication	BOOL		O	X
JOB_B_1_O	DR31: Job acknowledgment bit used for I/O communication	BOOL		O	X
ST_CNT_1_O	DR31: Status counter	BYTE		O	X
DIG_V_NC_1_O	DR31: Current digit value (filtered, not scaled)	WORD		O	X
DCV24_1_O	DR31: Asynchronous error: External supply voltage 24V	BOOL		O	X
RES131_1_O	DR31: Asynchronous error: Reserve	BOOL		O	X
RES231_1_O	DR31: Asynchronous error: Reserve	BOOL		O	X
RES331_1_O	DR31: Asynchronous error: Reserve	BOOL		O	X
RES431_1_O	DR31: Asynchronous error: Reserve	BOOL		O	X
RES531_1_O	DR31: Asynchronous error: Reserve	BOOL		O	X
RES631_1_O	DR31: Asynchronous error: Reserve	BOOL		O	X
RES731_1_O	DR31: Asynchronous error: Reserve	BOOL		O	X
ADC_L_1_O	DR31: Asynchronous error: Control limit ADC, Channel 1	BOOL		O	X
V_MIN_1_O	DR31: Asynchronous error: Minimum voltage on sense line, Channel 1	BOOL		O	X
W_DOG_1_O	DR31: Asynchronous error: Watchdog triggered	BOOL		O	X
EPROM_E_1_O	DR31: Asynchronous error: Error in EPROM (program)	BOOL		O	X
EEPROM_E_1_O	DR31: Asynchronous error: Error in EEPROM (data)	BOOL		O	X
RAM_E_1_O	DR31: Asynchronous error: Error in RAM (read/writ error)	BOOL		O	X
ADC_E_1_O	DR31: Asynchronous error: ADC error durin read-access, Channel 1	BOOL		O	X
GR_OF_1_O	DR31: Asynchronous error: Number for gross weight overflow, Channel 1	BOOL		O	X
RES831_1_O	DR31: Synchronous error: Reserve	BYTE		O	X
A_CMD_E_1_O	DR31: Synchronous error: Distance to adjustment points too small	BOOL		O	X
MFCT_1_O	DR31: Synchronous error: Job could not be	BOOL		O	X

Connection (Parameter)	Meaning	Data type	Default setting	Type	O&O
	executed due to malfunction				
CH_E_1_O	DR31: Synchronous error: A non-existent or inactive channel was addressed	BOOL		O	X
CMD_E_1_O	DR31: Synchronous error: Undefined code or incorrect data in data records	BOOL		O	X
DR_E_1_O	DR31: Synchronous error: Wrong number for data record	BOOL		O	X
CMD_A_E_1_O	DR31: Synchronous error: Command not possible since scales not adjusted	BOOL		O	X
S5_PER_1_O	DR31: Synchronous error: Wait time of 5 sec not adhered to during adjustment commands	BOOL		O	X
A_WGHT_N_1_O	DR31: Synchronous error: The adjustment weight is negative	BOOL		O	X

Table 4-21 CFC–connections of SIWA_U08 – D31 outputs, not scaled

Process values channel 2 (Data record 32)

Output (scaled value):

Connection (Parameter)	Meaning	Data type	Default setting	Type	O&O
GROSS_2_O	DR32: Gross value, Channel 2	REAL		O	X

Table 4-22 CFC–connections of SIWA_U08 – DS32 output, scaled value

Output (not saled):

Connection (Parameter)	Meaning	Data type	Default setting	Type	O&O
GROSS_NC_2_O	DR32: Gross value, Channel 2 (not scaled)	INT		O	X
ASYNC_E_2_O	DR32: Asynchronous error (group error)	BOOL		O	X
SYNC_E_2_O	DR32: Synchronous error (group error)	BOOL		O	X
L_V1_2_O	DR32: Limit value 1, Channel 2	BOOL		O	X
L_V2_2_O	DR32: Limit value 2, Channel 2	BOOL		O	X
SC_A_2_O	DR32: Scale adjusted, Channel 2	BOOL		O	X
UPD_B_2_O	DR32: Bit is inverted each time the Siwarex U updates its measured value	BOOL		O	X
LIFE_B_2_O	DR32: Life bit used for I/O communication	BOOL		O	X
JOB_B_2_O	DR32: Job acknowledgment bit used for I/O communication	BOOL		O	X
ST_CNT_2_O	DR32: Status counter	BYTE		O	X
DIG_V_NC_2_O	DR32: Current digit value (filtered, not scaled)	WORD		O	X
DCV24_2_O	DR32: Asynchronous error: External supply voltage 24V	BOOL		O	X
RES132_2_O	DR32: Asynchronous error: Reserve	BOOL		O	X
RES232_2_O	DR32: Asynchronous error: Reserve	BOOL		O	X
RES332_2_O	DR32: Asynchronous error: Reserve	BOOL		O	X
RES432_2_O	DR32: Asynchronous error: Reserve	BOOL		O	X
RES532_2_O	DR32: Asynchronous error: Reserve	BOOL		O	X
RES632_2_O	DR32: Asynchronous error: Reserve	BOOL		O	X
RES732_2_O	DR32: Asynchronous error: Reserve	BOOL		O	X
ADC_L_2_O	DR32: Asynchronous error: Control limit ADC, Channel 2	BOOL		O	X
V_MIN_2_O	DR32: Asynchronous error: Minimum voltage on sense line, Channel 2	BOOL		O	X

Connection (Parameter)	Meaning	Data type	Default setting	Type	O&O
W_DOG_2_O	DR32: Asynchronous error: Watchdog triggered	BOOL		O	X
EPROM_E_2_O	DR32: Asynchronous error: Error in EPROM (program)	BOOL		O	X
EEPROM_E_2_O	DR32: Asynchronous error: Error in EEPROM (data)	BOOL		O	X
RAM_E_2_O	DR32: Asynchronous error: Error in RAM (read/writ error)	BOOL		O	X
ADC_E_2_O	DR32: Asynchronous error: ADC error during read-access, Channel 2	BOOL		O	X
GR_OF_2_O	DR32: Asynchronous error: Number for gross weight overflow, Channel 2	BOOL		O	X
RES832_2_O	DR32: Synchronous error: Reserve	BYTE		O	X
A_CMD_E_2_O	DR32: Synchronous error: Distance to adjustment points too small	BOOL		O	X
MFCT_2_O	DR32: Synchronous error: Job could not be executed due to malfunction	BOOL		O	X
CH_E_2_O	DR32: Synchronous error: A non-existent or inactive channel was addressed	BOOL		O	X
CMD_E_2_O	DR32: Synchronous error: Undefined code or incorrect data in data records	BOOL		O	X
DR_E_2_O	DR32: Synchronous error: Wrong number for data record	BOOL		O	X
CMD_A_E_2_O	DR32: Synchronous error: Command not possible since scales not adjusted	BOOL		O	X
S5_PER_2_O	DR32: Synchronous error: Wait time of 5 sec not adhered to during adjustment commands	BOOL		O	X
A_WGHT_N_2_O	DR32: Synchronous error: The adjustment weight is negative	BOOL		O	X

Table 4-23 CFC–connections of SIWA_U08 – D32 outputs, not scaled

4.1.17 Modul info (data record 40)

Outputs:

Connection (Parameter)	Meaning	Data type	Default setting	Type	O&O
VER_O	DR40: FW version	WORD		O	X
CH_SUM_O	DR40: Checksum	WORD		O	X
RES140_O	DR40: Reserve	BYTE		O	X
CH_O	DR40: Depends on number of channels	BYTE		O	X
MOD_T_O	DR40: 0=7MH4601... 1=7MH4950....	BYTE		O	X
I_CNT_O	DR40: Internal counter	BYTE		O	X

Table 4-24 CFC–connections of SIWA_U08 – DS40 outputs

4.2 CFC CMD_SU08 (FB651)

4.2.1 Calling OBs

The block should be installed in the timed interrupt OB, in which the associated driver block of the Siwarex-module is also processed (e.g. OB32). The block must also be installed in the OB100 (carried out automatically in CFC):

4.2.2 Start-up characteristics

Internal flag variables are reset on start-up to enable every pending input bit to be identified as a positive edge and the corresponding command to be issued following initialization.

4.2.3 Function and functional principle

The CMD_SU08 block acts as the connection block for the driver block's automatic commands for controlling a Siwarex U module (SIWA_U08).

There is an input bit for every possible command code and for reading and writing data records. The corresponding command is initiated when the input bit has a positive edge. If several commands are started simultaneously, they are routed to the SIWA_U08 block sequentially. After a command is executed, the subsequent pending command to be executed is searched for from its position. Command codes pending at inputs HPRIO1..5 are executed with a higher priority than all other commands (HPRIO1 has the highest priority) and, if necessary, also interrupt linked commands (CMD_601 to 699).

Commands are not routed from the CMD_SU08 command block to the SIWA_U08 driver block when in manual mode.

4.2.4 Interconnection with SIWA_U08 block

Inputs MAN_AUT, CMD_FOK and CMD_ERR of the CMD_AWI block must be connected to outputs QMAN_AUT, CMD_FOK and CMD_ERR of the SFT_AWI block. Outputs AUT_CMD and AUTCMDEN are connected to the SFT_AWI block inputs of the same name.

4.2.5 I/Os of CMD_SU08

Connection (Parameter)	Meaning	Data type	Default setting	Type	O&O
MAN_AUT	1=AUTO, 0=MANUAL Mode (for connection with QMAN_AUT of SIWA_SU08)	BOOL	FALSE	I	
CMD_FOK	Command ended without error (for connection with CMD_FOK of SIWA_SU08)I)	BOOL	FALSE	I	
CMD_ERR	Command ended with error (for connection with CMD_ERR of SIWA_SU08))	BOOL	FALSE	I	
HPRIO1..5	Commands executed with higher priority (HPPRIO1 has the highest priority)	INT	HPRIO 1..5: 0	I	
CMD01..CMD199	Commands 1 to 199	BOOL	FALSE	I	
RD_DR1..130	Read data record 1..130	BOOL	FALSE	I	
WR_DR1..130	Write data record 1..130	BOOL	FALSE	I	
CMD601..699	Commands 601..699 (linked commands)	BOOL	FALSE	I	
RESET	Reset block	BOOL	FALSE	IO	
AUT_CMD	Automatic error codes (for connection with AUT_CMD of SIWA_SU08))	BOOL	FALSE	O	
AUTCMDEN	1= Execute automatic command (for connection with AUTCMDEN of SIWA_SU08))	BOOL	FALSE	O	

Table 4-25 CFC – Connections of CMD_SU08

4.3 MOD_SU08 (FB662)

4.3.1 Area of application

The block acts as the interface of a Siwarex scale module for the PCS 7 maintenance station

4.3.2 Calling OBs

Timed interrupt OB, in which you install the block (e.g. OB32). The block must also be installed in the following OBs in the run sequence (carried out automatically in CFC):

OB100 Restart

4.3.3 Use in CFC

The CFC function "Generate module drivers" automatically:

- Installs the MOD_SIWA block in its runtime group at the blocks named above, downstream from the RACK block runtime group
- Configures the inputs SLOT, RACK_NO, SUBN1_ID, SUBN2_ID
- Interconnects

  - inputs PERAF, MODF and RACKF are connected to outputs QPERAF, QMODF and QRACKF of the corresponding MOD_1-block

  - inputs PARF and PA_DIAG are connected to outputs QPARF und ODIAG of the corresponding Siwarex driver block

4.3.4 Function

The block forms the maintenance state (MS) for the Siwarex module and sends the corresponding messages to WinCC.

MS	Condition
0, good	No error
7, maintenance; need high	Module removed/defective (MODF = 1) or Module not operative (PA_DIAG = 16#0100)
8, uncertain	Rack error (RACKF = 1)

Table 4-26 Maintenance-States of MOD_SU08

4.3.5 Message text and message class assigned to the block parameters

Message block ALARM_8P	Message no.	Block parameter	Default message text	Message class
EV_ID	1	QMODF	Device @1%d@/ @2%d@/ @3%d@: Withdrawn	S
	2	QPARF	Device @1%d@/ @2%d@/ @3%d@: Configuration error	S
	3	QPERAF	Device @1%d@/ @2%d@/ @3%d@: Access error	S
	4	QMOD_ERR	Device @1%d@/ @2%d@/ @3%d@: bad, maintenance alarm	S

Table 4-27 CFC Message texts of MOD_SU08

4.3.6 Assignment of associated values to the block parameters of MOD_SIWA

Message block ALARM_8P	Message no.	Block parameter	Meaning
EV_ID	1	SUBN1_ID	Number DP master system
	2	RACK_NO	Subassembly support/station number
	3	SLOT_NO	Slot number

Table 4-28 CFC associated values of MOD_SU08

4.3.7 I/Os von MOD_SU08

Connection (Parameter)	Meaning	Data type	Default setting	Type	O&O
CH_EXIST	Channel available	DWORD	0	O	+
CH_OK	Channel OK	DWORD	0	O	+
EN_MSG	1 = Message cleared	BOOL	TRUE	I	
EV_ID	Message number	DWORD	0	I	
MODF	1 = Module removed/defective	BOOL	FALSE	I	
MS	Maintenance status	DWORD	0	I	+
MSG_ACK	Message acknowledgement	WORD	0	O	
MSG_STAT	Message error information	WORD	0	O	
O_MS	Maintenance status	DWORD	0	O	
PA_DIAG	PA diagnostic information	DWORD	0	I	
PARF	1 = Configuration error	BOOL	FALSE	I	
PERAF	1 = Peripheral access failure	BOOL	FALSE	I	
QERR	1 = Error	BOOL	FALSE	O	
QMODF	1 = Module removed/defective	BOOL	FALSE	O	
QMSG_SUP	1 = Message suppression active	BOOL	FALSE	O	+
QMSGERR	1 = Message error	BOOL	FALSE	O	

QMOD_ERR	1 = Siwarex module error	BOOL	FALSE	O	
QPARF	1 = Parameterization failure	BOOL	FALSE	O	
QPERAF	1 = Peripheral access error	BOOL	FALSE	O	
QRACKF	1 = Subassembly support/station error	BOOL	FALSE	O	
RACK_NO	Subassembly support number	BYTE	0	I	
RACKF	1 = Subassembly support/station error	BOOL	FALSE	I	
RUNUPCYC	Initialization cycles	INT	10	I	
SLOT_NO	Slot number	BYTE	0	I	
SUBN1_ID	Number of the primary DP master system	BYTE	16#FF	I	
SUBN2_ID	Number of the redundant DP master system	BYTE	16#FF	I	

Table 4-29 CFC – connections of MOD_SU08

5 Description of the Faceplates

5.1 General

Operation and monitoring of the scale via WinCC faceplates is described below.

Descriptions of the individual scales parameters and scale functions are provided in the SIWAREX U manual and are not explained individually where each faceplate is displayed.

The example faceplate for the SIWAREX U modules was created with the Faceplate Designer from PCS7 version 6.1. The WinCC images and scripts that are created can be modified according to individual requirements.

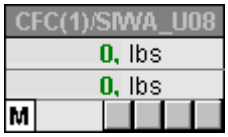
Every time a new view is opened, the displayed parameters are read. Data is not reread when tabs within a view are switched. Data can be updated at any time by clicking the "Receive Data" button.

5.2 Calling Up Faceplates

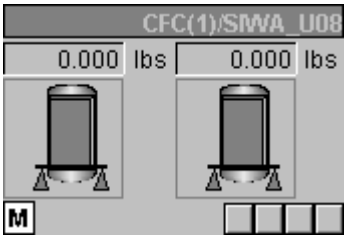
The process for calling up faceplates can be configured in the Graphics Designer (Dynamic Wizard -> Picture Functions -> Picture selection via measurement point). The faceplates themselves can be called up via the Typical provided.

5 different typicals are available, one with weight display and a second with silo and weight display.

Alternative 1:

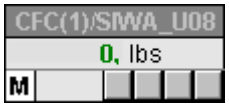


Alternative 2:

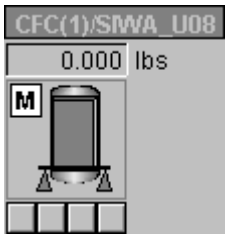


Alternative 3:

Alternative 4:



Alternative 5:



The Typical is defined in CFC SIWA_U08. A checkmark is set against "Create block icon" in CFC properties. The Typical is defined in the field underneath:

Blank, 1 : Typical with 2 weight displays for 2 channels

2 : Typical with 2 weight displays and 2 silos

3 : Typical with 2 weight displays and one silo

4 : Typical with one weight displays (channel 1)

5 : Typical with one weight displays (channel 1) and one silo

0, >5 : no typical

The selection is imported into the OS through OS compilation.

5.3 Faceplate Display in OS

All views of the sample faceplate including their functions are shown in the following sections.

5.3.1 Standard View

The standard view displays the current weight value of the scale and a number of selected statuses. The Manual/Automatic operating modes can also be switched.

When only channel 1 is active, the view of channel 2 is masked. For this first the data record 40 has to be read.

In automatic mode, only reading of data records is permitted.

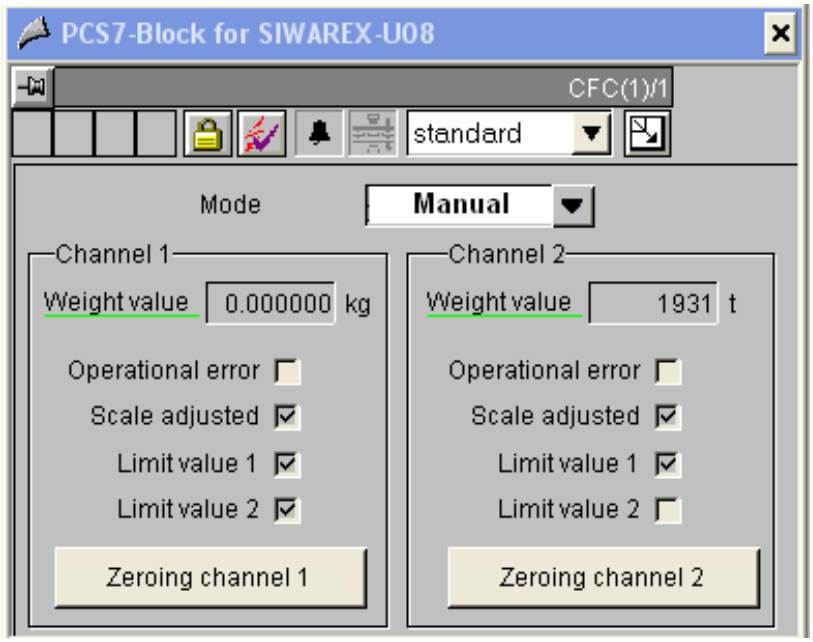


Fig 5-1 Standard view for SIWAREX U

5.3.2 Service view

There are two separate service views for channel 1 and channel 2, which are designed identically.

There are three service tabs.

Editing the tab calibration enables scale adjustment from the OS. Here core parameters for data records 3 (channel 1) and 4 (channel 2) are set. Limits can be set in the Limits tab. Scale commands can be issued in the Operation tab and so the scale can be operated.

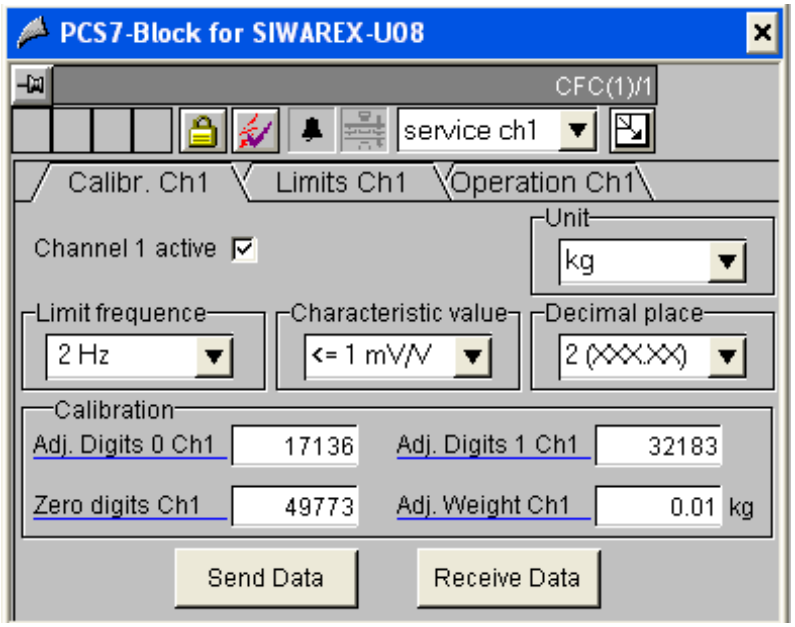


Fig. 5-2 View calibration channel1

ATTENTION: Before the input of the weight values **first** the decimal place has to be set.

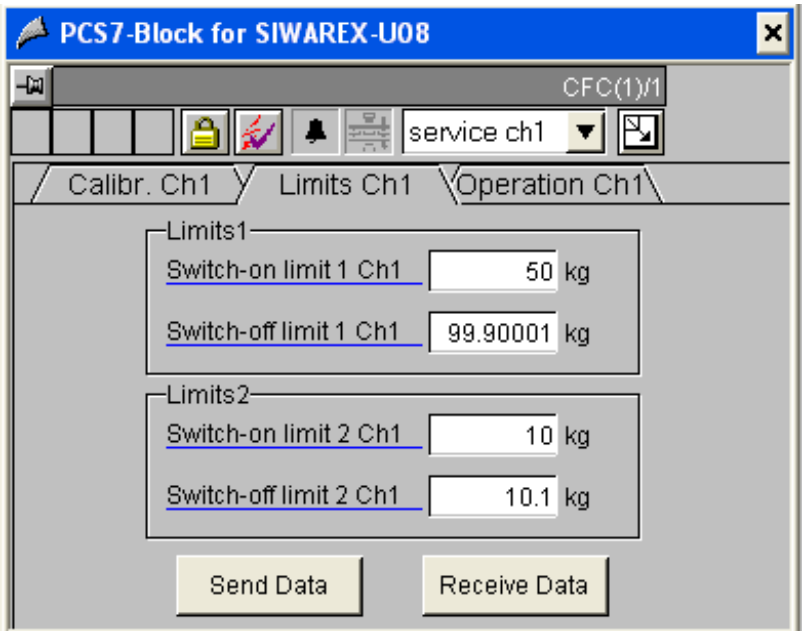


Fig. 5-3 View limits channel 1

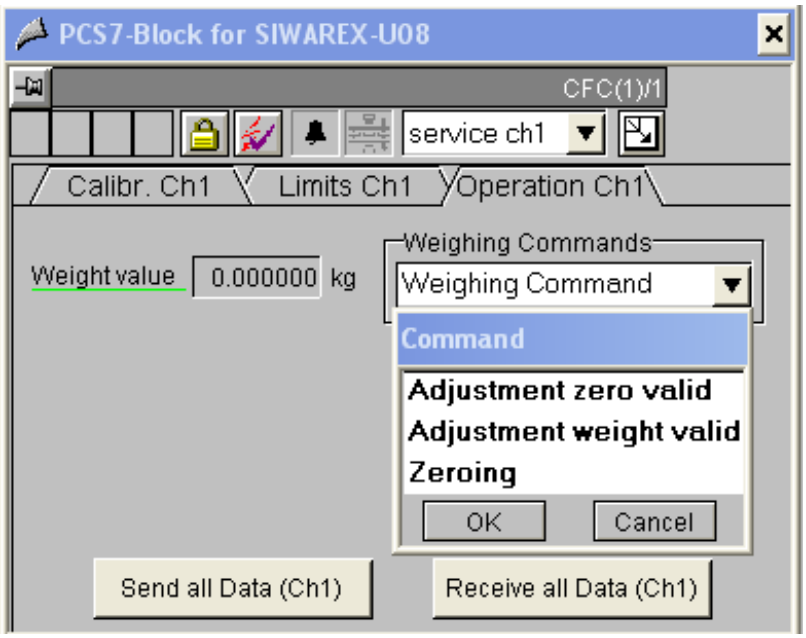


Fig. 5-4 View operation channel 1

5.4 Faceplate creation

Mainly, those standard items that are described in the documentation on the Faceplate Designer and that have been delivered with the Faceplate Designer are used. This description concentrates on the features that have been implemented for the SIWAREX U Faceplate.

Tabs

To help clarify matters, two Faceplate view with up to 4 tabs have been shown in different images. Switching between the tabs is done using function „SH6_ChangeView_tab.fct“. Each tab must have the name of the image that it is calling.

Reading data record during selection of faceplate view

A command to read data displayed in the faceplate view is always issued for the FP_CMD manual input when a new view is added in the faceplate. The function block copies the value from FP_CMD to the MAN_CMD manual input when no other command (MAN_CMD=0) is present here. This prevents any potential commands pending at the MAN_CMD input from being overwritten when the view in the faceplate is changed.

The button used to read data is inactive while a data record is being read, in order to indicate this.

Operating authorization

In every view, an element having the name „Level5_MODE“ or „Level6_MODE“ is found. These elements do not only the enable operating authorization from the User Administrator but they also deny operating authorization in Automatic operating mode. This is done with function „SH6_CheckPermission_Plus.fct“, which is called when the image is loaded and when the operating mode is changed. Passing the operating mode to the individual elements is performed through direct connections.

Only the Manual-Automatic switch with the "single operating authorization" (level5) can be used with the default settings. All other operations require the "higher value operating authorization“ (level6).

Combo-boxes with several entries

Various combo-boxes have 3 or more entries. These combo-boxes are described further using an example of the combo-box for the dosing commands.

With a mouse click on the combo-box, the image „@PG_SIWA08_SCROLL_WEIGHING_CH1.pdl“ is opened.

The image „@PG_SIWA_U08_SCROLL_WEIGHING_CH1.pdl“ is based on the „@FPD_BedAnalog.PDL“ image. The main difference is that the analog value is not entered in the IO-field, instead, a command which has an analog value assigned as the command code is selected. The commands are listed in individual text fields in the image @PG_SIWA_U08_CMD_WEIGHING.pdl“:

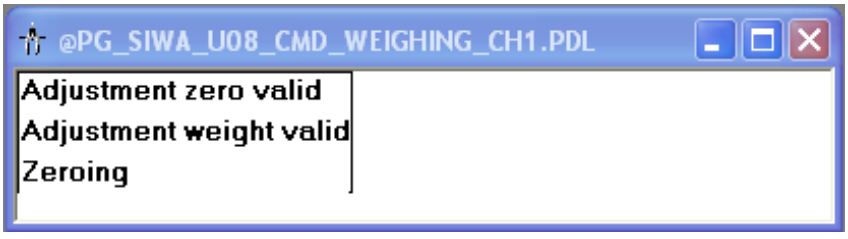


Fig. 5-5 Command selection

While selecting a command with the mouse, the command code is written into the IO-field "Value" of the „@PG_SIWA_U08_SCROLL_WEIGHING.pdl“ image. If the output value „Value“ is changed then the transmitted command is highlighted in colour and the respective command code is transferred to the block with „OK“.

6 Configuration Example

One of the sample projects in SIMATIC Manager is the zXy70_06_SIWAREX_U08 project; this allows a PCS7 configuration for SIWAREX U to be quickly and easily established through several adjustments to its own environment. The example is applicable to two scales. For instance, SIWA_U08 is configured for one scale, while SIWA_U08 in conjunction with CMD_SU08 is configured for the other.

For the project to be adapted, the following must be carried out in particular:

- the hardware configuration must be adapted
- connections must be secured
- suitable addresses must be configured on SIWA_U08.

7 Abbreviations

AS	Automation system
CFC	Continuous Function Chart (PCS7)
DO	Digital output
DI	Digital input
DR	Data record
FC	STEP7 Function call
FB	Function block
HSP	Hardware Support Package
HW	Hardware
OS	Operator Station
PC	Personal-Computer
SFC	System Function Call (System function)
SIWATOOL	Windows-Software Commissioning and Service of SIWAREX FTA